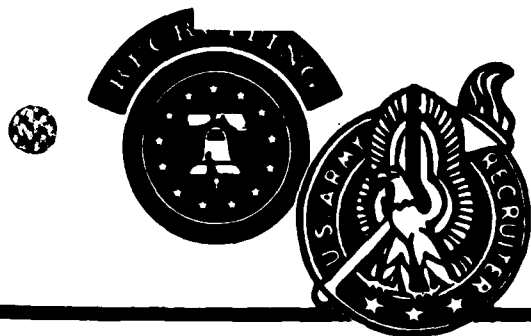


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United States Army
Recruiting Command

USAREC SR 86-5

**A CRITICAL ELEMENT
OF
ARMY RECRUITING
STRATEGY
AN AFFORDABLE G.I. BILL**

**BY
ROBERT L. PHILLIPS**

May 1986

**Approved for Public Release;
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AN AFFORDABLE GI BILL

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Robert L. Phillips

May 1986

USAREC Study Report 86-5

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U.S. Army Recruiting Command
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DISCLAIMER

The views, opinions, and findings in this research memorandum are those of the author and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other authorized documents.

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ABSTRACT



Recognizing the unique nature of military service, the differences among the various services constituting the Armed Forces, the wide variances in jobs within a specific service, the need for quality accessions for the Army, and at least a two-segment youth market (work-oriented versus college-bound), a dual approach to the construction of enlistment incentives was adopted. It was suggested that college-bound youth would respond best to a shorter enlistment commitment with high, post-service educational benefits. On the other hand, work-oriented youth would respond best to pay, bonuses, skill training, and job security.

The GI Bill or a similar type of incentive is essential for the execution of a dual market strategy. However, since cost has been the reason for most opposition to past and present GI Bills, a reduced cost, Army-only GI Bill was proposed, that would be targeted to skill demands and applicant human capital. The Army-only nature of the proposed bill stems from the contention, ranging as far back as the Gates Commission, that the Army has the most difficult recruiting mission. Further, such an incentive is not only key to the Army's dual market strategy, but also is designed to lessen interservice competition by opening a new market segment (college-bound) -- youth who would not otherwise consider any military service.



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In July 1985, the current GI Bill took effect; it reduced the service member's contribution to \$1,200 and raised basic benefits to \$10,800, paid out in a manner similar to VEAP. The ACF continued, but now it was based upon the GI Bill rather than VEAP and had slightly higher maximum amounts--\$17,000, \$22,800, and \$25,200 for a 2-, 3-, and 4-year tour, respectively. Keep in mind that this is basically a two-tiered program--a GI Bill for everyone (\$10,800), and special incentives (the higher amounts) keyed to applicant qualifications and specific Army specialties. However, there is a current initiative to eliminate the 1985 GI Bill.

It seems that policy makers have little understanding of the role of educational incentives. Its "on again-off again" history, together with the sometimes contradictory rationale for its existence, testifies to the current state of confusion, which stems, at least in part, from four factors:

1. A failure to appreciate the enormous differences between serving in the Armed Forces and being in the labor market.
2. The failure to discern significant differences among services and among jobs within each service--i.e., the tendency to view the Armed Forces as a homogeneous mass.
3. A disagreement with, or failure to acknowledge, the need for quality accessions (youth with at least a high school education and high trainability score) for all the services.
4. A lack of appreciation of the interaction between human capital and educational incentives.

Although there are several complex factors contributing to the confusion concerning the efficacy of a GI Bill, there is usually only one factor causing dogged opposition--cost. What follows is an attempt to analyze the four factors, cited above, plus a proposal on how to reduce cost.

DIFFERENCES BETWEEN THE ARMED FORCES AND THE LABOR MARKET

In a study prepared for the Gates Commission, Allen Fechter (1970) acknowledged that expected differences ("nonpecuniary aspects") existed between military and civilian jobs. He further believed that a dollar value could be placed on such differences in that

...the individual is able to stipulate the number of dollars of additional pay or pecuniary benefits that he would require to offset the nonpecuniary cost associated with what he thinks are distasteful conditions of service life....

(Fechter, 1970, P.II-3-2)

Thus, with the end of conscription, many officials and observers asserted there was basically no difference between being a member of the Armed Forces and being a worker in the civilian labor market. After all, choice was exercised in the decision for service as well as, in many cases, for a specific military specialty. Moreover, the increased pay by the military erased any lingering, service-connected disadvantages. Although in certain instances there is risk of life or limb in military service, there are similar risks in civilian police and fire departments. Thus, there was a greatly reduced impetus for paternalistic programs to compensate servicemen for "required sacrifices."

The Gates Commission did not neglect to consider educational incentives. These, however, were also viewed as paternalistic or "compensation-in-kind" type of incentives and were judged to be inefficient when compared to pay.

Many recommendations have been made for increasing military compensation-in-kind, including improved housing, educational programs, dental care for dependents, etc.

...we have decided against recommending general increases in such benefits....

...general increases in non-cash pay would be an inefficient means of compensating military personnel.

(Gates, 1970, pp. 62-63)

Thus, partly as a result of the early success of recruiting a volunteer force, the Gates Commission Report, and the high cost, Congress terminated the earlier GI Bill effective the last day of 1976. It should be kept in mind that the earlier GI Bill was not an inducement to volunteer as much as a compensation for being drafted and forced to endure certain unpleasant conditions of service, as well as for being forced to forego alternate economic endeavors. However, as indicated earlier, with an appropriate increase in the pay scale, it was felt that a GI Bill was no longer needed as compensation for an unfair draft, nor was required as an inducement to volunteer. The key assumption was that an applicant could, with reasonable accuracy, estimate the additional pay he would need to offset his preconceived notions of "the distasteful conditions" of service life as well as his alternate economic pursuits.

Perhaps it might be worthwhile to discuss a few of the nonpecuniary differences that a young soldier will most likely experience? First, the key difference between military service and any other job in the general labor market is what is referred to as the "unlimited liability contract." Simply put, this means that once an individual agrees to join the service, little else is left to choice, including the option to terminate the service (labor) contract prior to its expiration date. The policeman and fireman, however, may quit, whenever they so desire; nor, do they have to move to other cities, or overseas. Further, they may refuse a transfer to a different assignment within the their organization. Finally, conditions of lifestyle are usually less rigorous. Thus, in theory at least, one should expect a considerable difference between service jobs and jobs in general--even those of policeman and fireman.

Fortunately, there is some empirical evidence comparing perceived job aspects in the civil and military sectors. Blair and Phillips (1983) pointed out that of some 17 job dimensions, military men aged 18-21 had lower satisfaction scores in 16 dimensions and a significantly higher score in only one -- job security (see table 1). Further, the global job satisfaction measure was much lower for service personnel. Notice too, that the largest disparity between the military and civilian sector is pay (2.04 versus 2.97). Thus, not only were most job aspects viewed by military personnel in a less positive light, but pay itself, the focus variable of the Gates Commission was also a key item of dissatisfaction. However, the armed forces members did perceive job security as being greater in the service. Basically, one might waggishly conclude that while you have a job filled with distasteful conditions and poor pay, you do have greater job security. In fact, you may not quit even if that was your desire.

Perhaps the key point to be made from the great disparity between Armed Forces jobs and the labor market is it is very doubtful that a young man or woman realizes the disparity prior to experiencing the service jobs.

DIFFERENCES AMONG SERVICES

To examine evidence of differences among services, one must again consider the basic tenet that the individual is able to stipulate a pay amount that would offset the nonpecuniary costs that are associated with service life, and treat this tenet as an assumption. Thus, if all services have similar rates of

Table 3. Characteristics of male youth, aged 18 through 21,
in the Armed Forces and in the civilian labor market,
in percent

<u>Characteristic</u>	<u>Army</u>	<u>Marine Corps</u>	<u>Navy</u>	<u>Air Force</u>	<u>Labor Market</u>
Education (high school diploma graduate)	61	70	77	96	74
Intelligence (KOWW)					
Highest Category	30	44	57	54	39
Lowest Category	31	24	14	9	23
Self-Confidence (top half)	43	54	60	65	54
Socioeconomic Status					
Parents' Education (some college)	24	26	37	37	24
Parents' Occupation (top category)	18	15	26	22	22
Health (problems affecting job)	4	8	7	3	4
Marital Status (married)	19	19	16	26	17

It must be emphasized that the wide disparities shown in table 3 between the Army and the other services occurred under conditions where all services offered the same pay and fringe benefits. When one analyzes the data for similar-aged, unemployed males, it appears the Army was becoming the employer of last resort. Further, in the history of the volunteer force, only the Army has had a significant shortfall (17,000) of its accession mission. Thus, the

Table 4. Job satisfaction by service,
18- through 21-year-olds

	Total	
	Male	Female
Army	2.65	2.75
Marine Corps	2.82	2.75
Navy	2.82	3.37
Air Force	2.92	3.01
Labor Market	3.18	3.25

evidence strongly suggests that not only are there significant differences in job satisfaction and quality of work force between military and civilian sectors, there are also large differences among the services themselves, with the Army in the worst position.

Significantly, the Gates Commission predicted that the Army would have the greatest difficulty in obtaining volunteers.

Voluntary enlisted deficits are the highest in the Army. This result, too, is to be expected, given that entry level pay is lowest for enlisted personnel and that the nonmonetary conditions of service are less attractive in the Army than in the other three services.

(Gates, 1970, p. 56)

Although the Commission predicted, and the evidence confirms, that the Army would have the most difficult recruiting task, the question is "Why?". Fortunately, there are some theoretical constructs that might provide an answer. Stouffer (1949), in his The American Soldier series, gave the following reasons servicemen chose a particular military specialty during WW II: status, civilian applicable skills, and minimum deprivations. Janowitz and Moskos (1979) examined the reasons for different military skill choices in peacetime and came

up with similar dimensions, with the exception of a new, peacetime-only dimension: civilian applicable skills; conditions of work, lifestyle, prestige; and peacetime/wartime training congruence. It may be worthwhile to speculate a bit, using the preceding dimensions, to assess each service.

It seems the Air Force would come out on top in almost all of the above dimensions, especially in percentages of civilian applicable skills, conditions of work (Air Force presently at fixed bases), and peacetime/wartime congruence. (With respect to peacetime/wartime congruence, consider that most Air Force jobs are of a support nature, e.g., F-15 radar repairman, where one would do the same thing in peace and war. The infantryman, on the other hand, has a very critical job in wartime, but in peacetime his role may be rather dull and drab.) The Navy and Marine Corps would probably fall between the Army and Air Force, based upon the empirical measures of perceived job aspects and overall job satisfaction. The Navy has a higher percentage of technical jobs, but perhaps the Marine Corps has somewhat higher prestige.

But, if it was recognized that the Army had the most difficult conditions of service, and also had the greatest need for personnel, yet historically had the lowest percentage of "true volunteers" during the draft era (Gates, 1970), then what was the solution? Surprisingly, it was not to provide the Army with special "Army-only" incentives, but to raise the pay of all the services to such a level that the Army could meet its quantitative and qualitative goals.

The recommended increases in basic pay are designed to provide the Army with the quantity and quality of volunteers required for an overall force level of approximately 2.5 million men. The evidence is overwhelming that, if compensation is set at levels which satisfy Army requirements, the other services will be able to attract enough qualified volunteers to meet their respective requirements.

(Gates, 1970, p. 57)

The policy of having equal pay for all services, while recognizing differences in conditions of service, carried with it the consequence of relegating the lowest human capital array to the Army. Further, if pay ever lagged in the future below Commission estimates or empirical requirements for accession flow sustainment, then the Army would be the first to fail in meeting its recruitment goals, as was the actual case. (This is not an attempt to criticize a 16-year-old report coming from a distinguished Commission whose recommendations have turned out to be prophetic. Rather, it is to suggest an alternate approach, which is discussed later.)

Not only is it necessary to take into account interservice differences, but differences within a service are also important. In this respect, Stouffer examined the propensity for and relative satisfaction with the several branches of the Army during WW II.

Because of the fact that the Air Corps was the most respected branch of the service, as well as the branch men would most like to be in, there was a rather close overall relationship between respect for branch and liking to be in it. However, where attitudes toward branches other than Air Corps are considered, an ambivalence is apparent. Although 18 percent of the men studied in 1943 respected most a combat arm, like Infantry, Field Artillery, and Armored Force (together with the Combat Engineers), as compared with only 13 percent who respected some other arm or service (Air Corps excepted), the picture was reversed when it came to wanting to be in a given branch. Only 15 percent said they wanted to be Infantry, Field Artillery, Armored Force, or Engineers, as compared with 35 percent who wanted to be in some other branch.

(Stouffer, 1949, pp. 299-300)

Figure 1 illustrates choice/satisfaction percentages, as graphed by Stouffer. Note that degree of job choice and satisfaction varies directly with the distance from "living in the mud" and the dangers of combat, as well as with the degree of technical (civilian applicability) requirements.

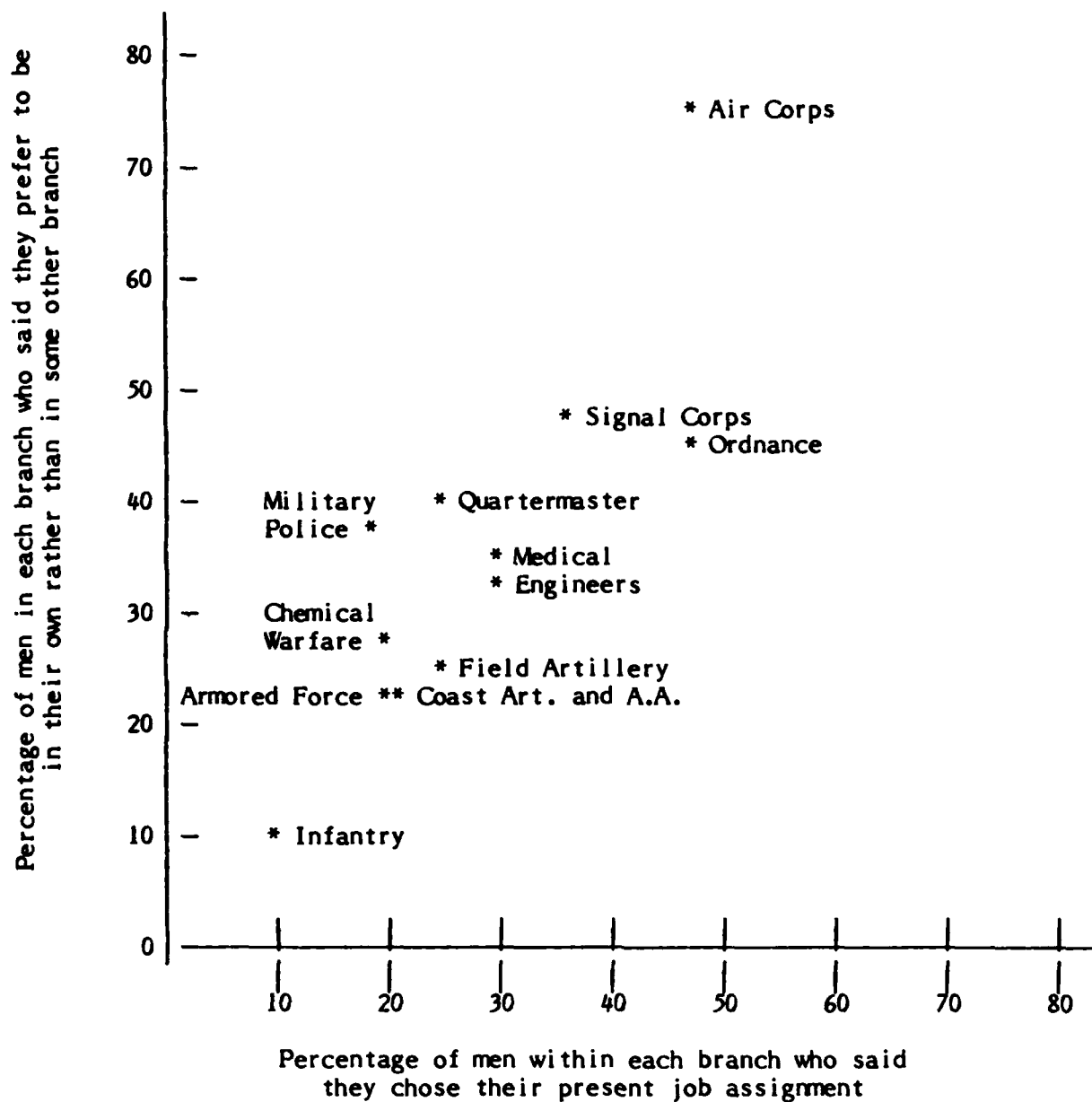


Figure 1. Relationship between chance to choose Army assignment and branch preference (troops in the United States)

Thus the empirical evidence and the studies by Stouffer, Janowitz, and Moskos indicate that there are indeed significant nonpecuniary differences between the services and within each service. Hence, recruiting and retention policies must vary accordingly. The great urge for equal pay and benefits for all services, and within each service, needs to be tempered with a realization of the differences between and within services. Fortunately, policy modifications, such as bonuses and terms of service, have been reflecting this realization, but the incentive mechanism must be further refined.

NEED FOR QUALITY ACCESSIONS FOR THE ARMY

The need for soldiers with at least a high school education and a reasonable trainability score (AFQT) is a controversial matter, especially concerning the combat arms. In reports that have made a case for Army quality (e.g., DePuy, 1983; Egbert et al., 1957; Fox, 1969; Toomepuu 1981; Armor et al., 1982; Shields and Grafton, 1983; Scribner et al., 1986) some of the key points favoring the quality argument are as follows:

- ° Complex Army equipment requires bright soldiers for maximum combat effectiveness.
- ° Complex maintenance procedures require educated soldiers to read and understand instructions.
- ° The need to deal with rapidly changing and confusing conditions of the battlefield demands resourceful individuals.
- ° The need for emergent leadership in battle demands a high degree of high ability.
- ° It costs less to train bright soldiers.
- ° There are fewer disciplinary problems with better educated soldiers.

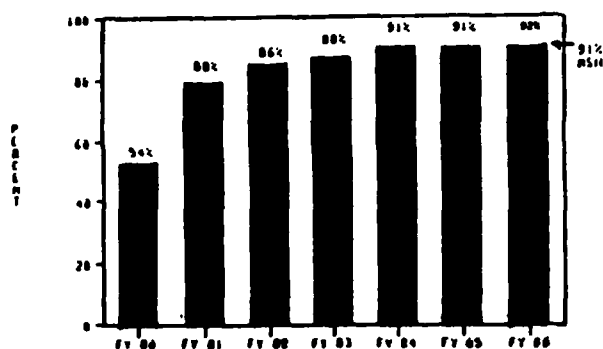
Opposition arguments to the above revolve around such notions that because many Army jobs are dirty and boring, only low-ability people are required; smarter soldiers will run away in battle; the Army needs to be an institution that can provide work for the unemployed; and, during Vietnam, Project 100,000 brought in a like number of low-ability soldiers who performed acceptably (although all research conducted on Project 100,000 showed that high ability soldiers performed significantly better). Of course, there are many other points on both sides of the quality issue. But, to subscribe to the current Army strategic position with respect to an educational incentive, it is necessary to acknowledge, if only for the sake of argument, the Army's quality requirements. Otherwise, the key point of a GI Bill-type of incentive is negated, since the Army could easily fill its ranks with low-ability personnel.

However, regardless of one's position on the quality requirements for various Army specialties, it is difficult to ignore the evidence in figure 2, which illustrates the benefits of quality with respect to several indices of indiscipline. Further, if one could cost the better maintenance, the lower failure rates of systems, etc. as a result of brighter crews, the case might be easily made. Unfortunately such cost data is not available.

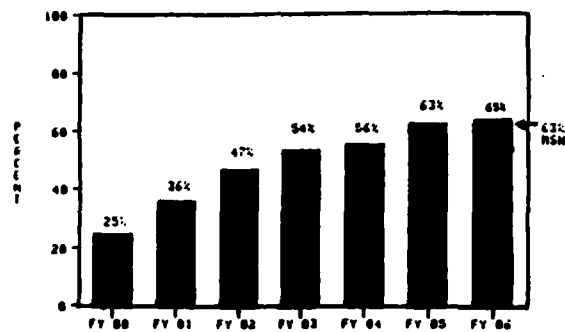
THE INTERACTION BETWEEN HUMAN CAPITAL AND ENLISTMENT INCENTIVES

Several studies over a period of years (Kim et al., 1980; Toomepuu, 1981; Bray et al., 1985) have established that the propensity to join any military service, and especially the Army, is inversely proportional to human capital.

HIGH SCHOOL DIPLOMA GRADUATE NON-PRIOR SERVICE ACCESSIONS

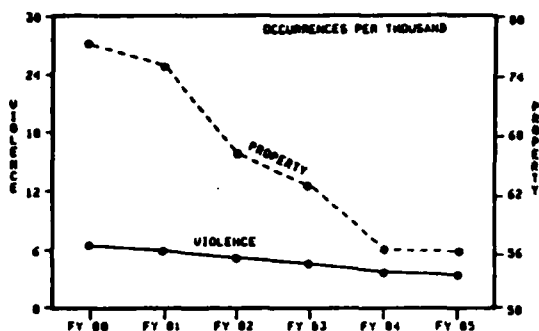


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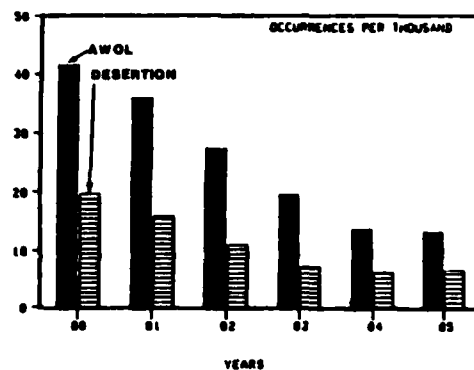


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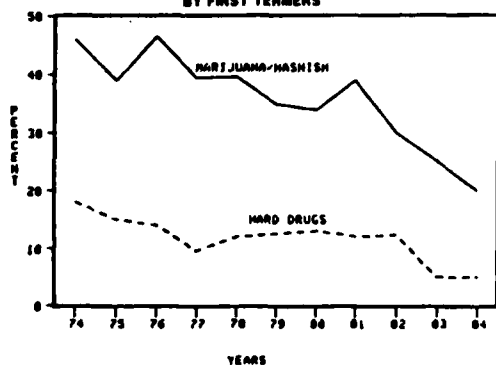
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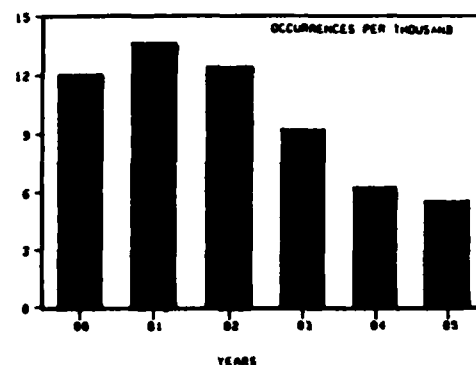
AWOL AND DESERTION



USE OF DRUGS BY FIRST TERMERS



COURTS MARTIAL



SOURCE: USASSC FC 21-451, I am the American Soldier, 31 March 1985

Figure 2. Comparison of quality of accessions and certain measures of indiscipline

Also, the effectiveness of incentives based upon up-front, bonus dollars; immediate employment; job security; and, learning a "skill" are also inversely proportional to human capital. The reason for this is rather simple--propensity to join a service as well as the incentives mentioned are highly correlated with work-oriented youth, i.e., noncollege-bound youth. Such youth, compared to their college-bound counterparts, tend to be less well educated and to score lower on the trainability measure (the Armed Forces Vocational Aptitude Battery, ASVAB). This is not surprising, since smarter high school graduates tend to want to go on to college. So, why not build a college incentive to enhance recruitment in a qualitatively richer pool? To do so, the Army introduced its "Dual Market" concept in 1980 (see figure 3).

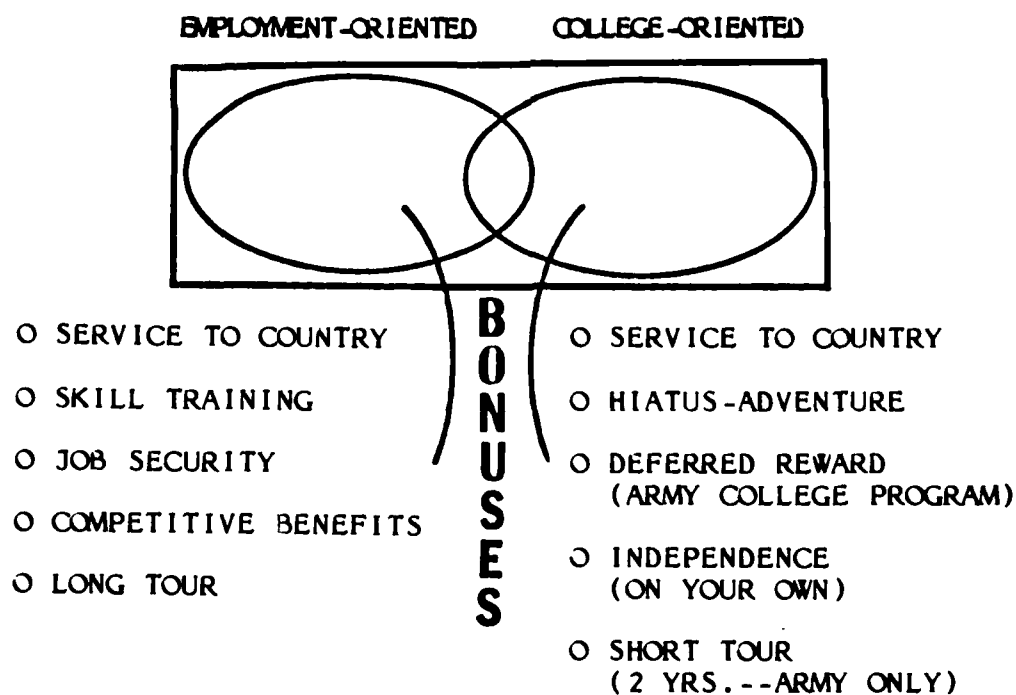


Figure 3. The Dual Market concept

The reasoning behind the Dual Market concept was fairly straightforward. The FY 1979 recruiting results (cited earlier) clearly established that without some sort of additional incentive, the Army could not meet its quantitative or qualitative goals. Thus, the decision was made to try to attract college-bound youth who, without a significant educational incentive, would not serve in any of the services.

If we were to return to the Stouffer, Janowitz, and Moskos dimensions mentioned earlier (prestige/status, civilian applicable skill, condition of work, peacetime/wartime congruence), it is evident that a significant, post-service educational incentive would have an important impact on recruitment. First, the notion of temporary employment to earn college money would improve the prestige/status dimension of Army service. It is, so to speak, an extended "work-study" program. Second, the dimension of civilian applicable skill would be enhanced since the Army would provide the means for obtaining a civilian skill through post-service education rather than through in-service training. Third, although the conditions of work and peacetime/wartime congruence are not affected, the notion of a shorter, temporary job (2 to 3 years at a maximum) would increase the soldier's tolerance for the unexpected, distasteful aspects of Army service, as would the knowledge that failure to complete the term of contracted service would result in a loss of the college benefit. This is a very important point if our suspicion is true that few applicants realize the extent of the military-civilian job disparity. Finally, the college money itself would have the same impact of as an increase in pay.

As a result of briefings to the then-Asst. Secretary of Defense (Manpower, Reserve Affairs, and Logistics), Dr. Larry Korb, the Army won DoD approval to run an educational experiment based upon the Veteran's Educational Assistance

Program (VEAP) plus special "kickers" that would yield \$15,200 for a 2-year tour and \$20,100 for a 3- or 4-year tour for selected skills with certain minimum applicant qualifications. (NOTE: The 3- and 4-year tours were equal because a 4-year enlistment for a critical skill included a special bonus of up to \$5,000.) However, the special incentives were to be offered only in certain test markets. Although the Army had argued that its recruiting problems were more severe than those of the other services (see earlier discussion on inter-service comparisons), it was felt that merely adding more bonus money, putting more recruiters in the field, etc., would simply exacerbate the competition with the Navy, Air Force, and Marine Corps for work-oriented youth. The Army wanted to open a new market segment--the college-bound youth--and thereby help meet its quality goal without increasing interservice competition. The field experiment would determine, among other things, the extent to which Army quality recruiting would be increased and the impact an Army-only incentive would have on the quality enlistments of the other services. (NOTE: The experiment was quite elaborate, with different programs tested in three experimental cells.)

In a word, the Army educational experiment was basically a success. Richard L. Fernandez (1982), who analyzed the experiment, stated in one of his conclusions:

In the design of a new program, the special problems faced by the Army should be recognized. The test has shown that one means of assisting the Army is to build more generous educational benefits into the Army Program. (p. viii)

However, Fernandez went on to say that simply because the program worked did not mean it was the only option, or was as cost effective as an alternative,

untested program. Nevertheless, the fact was that Army quality increased without reducing the quality "take" of the other services. The Army program went nationwide in FY 1982 and continues today, based upon the current GI Bill rather than on VEAP.

Figure 4 presents the male quality (defined as accessions who are high school degree graduates and score in category I-III A, the upper half, on the Armed Forces Qualification Test) percentage of enlistments for all services since 1980. There are two main points in figure 4. First, the Army's quality content has made a dramatic increase, improving faster than that of any other service. Second, the Army is simply reaching parity with the quality "shot group" established by the Air Force, Navy, and Marines.

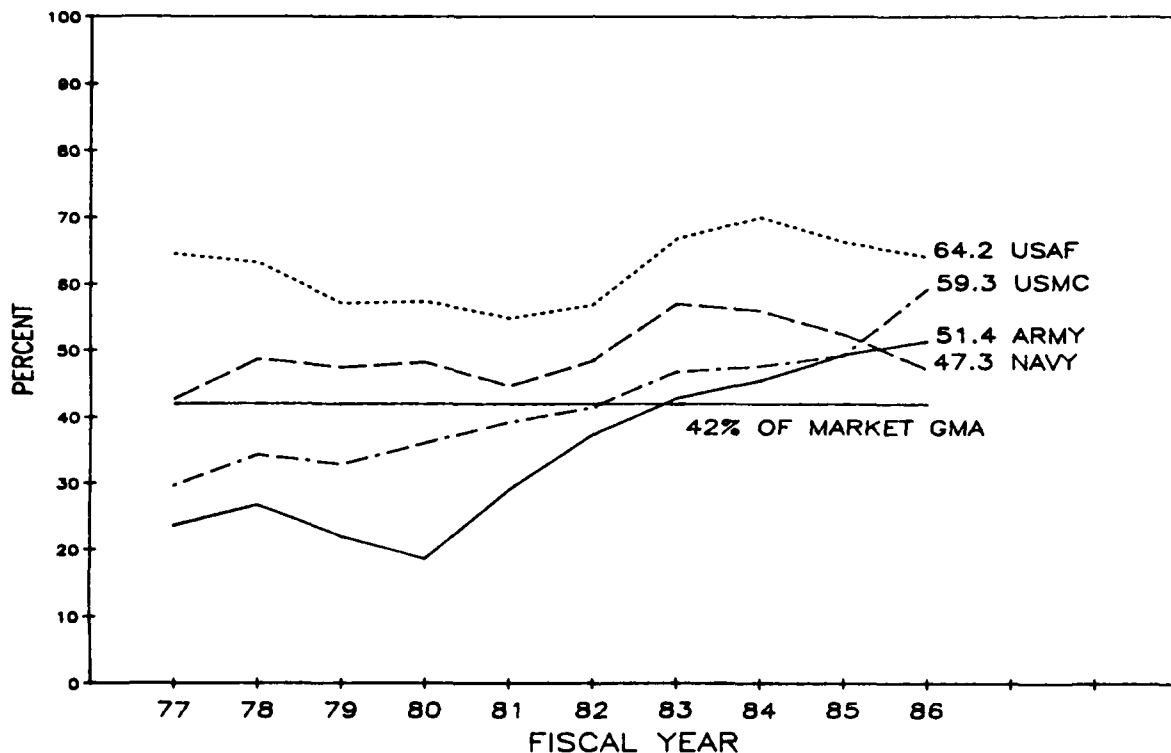


Figure 4. Graduate male TSC I-III A accessions as a percent of all non-prior service male accessions

A word of caution is required at this point, however. There are many variables that influence recruiting success. At the same time the Army's Dual Market concept took effect, several other leadership and managerial changes occurred which undoubtedly contributed to the dramatic quality improvement. (Attempts to mathematically isolate the impact of the educational incentive will be presented later.) But the key point is, on the basis of figure 4, it would be difficult to argue that the other services have been significantly damaged by the Army-only educational incentives.

There is another, very important aspect of the Army strategy that also needs to be discussed. As mentioned earlier, use of a college incentive increases the prestige of service. This is not to denigrate the notion of service as an altruistic act or as a sense of duty to country. But, as reports in the press suggested, service members in the 1978-80 period were less than optimally qualified. It was reasoned that appeals to college-bound youth would not only bring in bright individuals, but would also enhance the image of those serving. Further, although many young men and women may enlist simply to "get out of town and see what's on the other side of the mountain," they would want a better rationale to present to their parents, peers, and other influencers. In short, a GI Bill presents a socially acceptable reason for joining a service, regardless of whether or not one takes advantage of it.

ASSESSING THE IMPACT OF THE ARMY COLLEGE FUND (ACF)

When figure 4 was presented to show the increase in the quality of Army accessions relative to the other services, it was cautioned that many factors

other than the ACF were involved in the improvement. In an effort to assess the impact of the ACF kickers, while controlling for the other factors, five different research models were examined. All models were log-linear regression applications with high-quality (AFQT score of 50 or above and high school graduate) male enlistments as the dependent variable. Independent variables included variations in recruiter strength, unemployment rates, relative military pay, seasonality, advertising support, size of market, etc. Table 5 presents the results.

Table 5. Effects of ACF kickers in manpower supply models

Model	Description	Coefficient
Office of Economic and Manpower Analysis (Daula, Smith; 1985)	Log-linear regression on quality enlistment supply in a supply-constrained environment. Model accounts for mission effects.	.23
Recruitment Early Warning System (REWS) (Economic Research Lab, 1985)	1. Log-linear regression on quality contracts.	.16
	2. Regression as in 1 with addition of variables to account for advertising and recruiter resourcing.	.09
	3. Regression as in 1 with ACF a continuous variable (based on present value of dollar amounts) rather than a dummy variable.	.18
Army Research Institute studies using data from Recruiting Resources Allocation Model (ARI, 1984)	Log-linear regression on quality contracts that includes other service competition effects.	.28
USAREC Enlistment Model (Patchell, 1986)	Log-linear regression on quality contracts that weights ACF dummy variable to account for start-up effects.	.22

Differences in coefficients result from the different modeling approaches, but in all reviewed models, ACF coefficients were significant at better than the 5 percent level. The ACF is considered to be a highly effective program, especially when compared to the cost of attracting all high-quality enlistments from the work oriented market segment.

Historical data suggest that the actual cost of an educational incentive is approximately 10 cents on the dollar of the nominal (advertised) value. (See discussion and calculations at Appendix A.) One reason for such a low cost is that a soldier cannot draw benefits until he completes his service and the present value of the amount he draws then is considerably lower. Second, he will draw benefits over a 36-month period, and then only if he is enrolled on a full-time basis and goes to school year-round. Otherwise, the benefits are spread over a longer time period. Third, many soldiers earn benefits, yet never take advantage of them. Finally, of those soldiers who do earn and draw benefits, most do not use all of their entitlements. Thus, educational incentives are relatively inexpensive when compared to pay and bonus dollars. While it takes considerably more educational dollars (at nominal value) to have the impact on college-bound youth than the bonus has on work-oriented youth, a \$50,000 educational incentive at an actual cost rate of only 10 percent would not cost more than a \$5,000 bonus. One would surmise that when it comes to attracting a smart, high school graduate for service, an incentive of less than \$50,000 in educational benefits would suffice. Indeed, under the aforementioned calculations, costs for the maximum ACF amount is less than half the maximum bonus. Thus, we have the following situation. The Army needs special incentives in order to compete in the labor market on a basis comparable to other services.

The ACF is a key element in the Army's incentive structure. The GI Bill is the foundation upon which the ACF rests. If the GI Bill is lost, so too is the ACF unless some other GI Bill like program is established. But if another program is established, it is doubtful that it will have the marketability of the GI Bill whose basic concept parents, uncles, aunts, teachers, civilians, etc. understand. But there is another problem -- that of recruiting for the Army Reserve and the Army National Guard.

Unfortunately, it is still too early to isolate the impact of the new GI Bill exclusive of Army kicker (the ACF); however, for the Army Reserve such confounding is not a problem. Although there are still other factors that make cross-tabular comparisons difficult to interpret since Army recruiter strength, Army advertising dollars, relative pay, and unemployment were fairly stable between FY 1985 and FY 1986, the data in table 6 suggest that the new GI Bill has had a very positive impact on Reserve recruiting. Projections for the full FY indicate FY 86 will be a record year for quality recruiting in the Army Reserve.

Table 6. Impact of GI Bill on USAR recruiting

<u>Category of Enlistees</u>	<u>Without GI Bill Jul. 1984 - Mar. 1985</u>	<u>With GI Bill Jul. 1985 - Mar. 1986</u>	<u>Percent Change</u>
High School Graduate	17,289	21,677	+25.4
High Quality Enlistee (I-III A M/F)	9,025	13,269	+47.0

SOURCE: USAREC Mission Files

THE CURRENT DEBATE

Arguments concerning the GI Bill still have overtones of individual and national values versus a strict utilitarian view of cost and impact upon potential applicants. Both sides of these arguments are, in many cases, hopelessly intertwined. Nevertheless, a rough division can be attempted. Generally, arguments favoring the values standpoint focus on the following themes:

- o Opportunities for self-improvement through higher education should be part of the rewards for service to the country--a positive incentive for national service.
- o The return to colleges and universities of thousands of youth who have first served the nation will result in a stronger commitment to democratic values and social institutions when these students graduate and become key members of their communities.
- o Educational assistance programs should not be curtailed for those who elect to serve while such programs are dispensing several billion dollars in grants and loans to youth who are not required to do anything in return.
- o The nation is obligated to help returning service members readjust to civilian society; educational programs are the key.

The utilitarian arguments are based on the role of educational incentives as an inducement to join the military:

- o The Army College Fund is necessary in order for the Army to succeed in its quality accession mission.
- o Educational incentives play a key role in skill placement.
- o The name "GI Bill" itself has a strong attraction due to its positive impact over almost two generations.
- o Educational incentives provide a socially acceptable reason for joining.
- o Having viable educational incentives provides recruiters with better access to high schools.

- o Educational incentives improve the self-respect and morale of recruiters because they now have a genuine piece of "the American dream" to offer, thus increasing recruiter effectiveness.
- o A GI Bill is essential for successful recruiting for the Army Reserve.

Opponents of the GI Bill usually argue strictly on the basis of cost and utility:

- o The bill is too costly.
- o The bill is not needed to sustain a volunteer force.
- o A GI Bill for all service members is a waste of government money in that it pays benefits to individuals who would have joined without it.
- o The bill encourages service members to leave after their first term of service to allow them to take advantage of its benefits.

Exploration of all the above arguments (pro and con) in a thorough fashion is beyond the scope of this paper. However, without getting further involved with the merits or problems of the current GI Bill, it is apparent that some form of a GI Bill is necessary for the Army to continue to attract quality recruits. Further, it is not necessary that the incentive apply to all services, nor even to all specialties within a given service. But for certain skills, such as combat arms, the bill is critical. Further, such an incentive also appears critical to maintaining quality recruiting for the Army Reserve.

AN AFFORDABLE GI BILL

If it is decided by the national leadership to eliminate the current GI Bill on the basis of cost, then the Army will need a substitute educational incentive. However, the new incentive would not cost as much as the present GI Bill,

as the rationale for the new program would rest entirely on its utility as a recruiting vehicle. The assumption is that the country's elected representatives did not deem the values-based arguments to have sufficient merit to retain the current program for all service members.

The proposed program is based upon the dual market strategy mentioned earlier, and is a modification of the proposal made by Moskos (1982) concerning a two-track pay system. Further, the program is very similar to the earlier VEAP-based Army College Fund; but, unlike VEAP, it would apply to the Army Reserve as well.

Specifically, the soldier would be expected to contribute \$100 per month for each month of service, but be allowed to withdraw from the program at any time. Further, the soldier must complete his term of contracted service or forfeit his entitlement; however, any money contributed would be refunded at the time of discharge. All soldiers would be eligible to participate in the basic program, regardless of education, AFQT score, or skill. The Army would match the soldier's contribution 2 for 1; that is, for each dollar contributed by the soldier, the Army would contribute \$2 to the soldier's account. Thus, the basic program would be as described in table 7.

Table 7. Proposed basic Army GI Bill program

<u>Term of Service</u>	<u>Soldier's Contribution</u>	<u>Army Contribution</u>	<u>Total</u>
2 years	\$2,400	\$4,800	\$ 7,200
3 years	3,600	7,200	10,800
4 years	4,800	9,600	14,400

Although the basic program is similar to VEAP, the maximum amount earned is greater (VEAP was limited to \$8,100 total entitlement). A special incentive portion similar to the current ACF would be offered to applicants who are high school graduates with requisite AFQT score in accordance with the demands of special or hard-to-fill skills. The size of this "kicker" would depend upon the applicant's education, AFQT score, the particular skill selected, and his term of service. This special incentive would be constructed so that the highest kicker amount would go to the high school graduate with the highest AFQT score who chose the most critical skill for the longest term of service. Table 8 shows the average kicker amounts.

Table 8. Kicker values for proposed GI Bill

<u>Term of Service</u>	<u>Basic Program</u>	<u>Kickers</u>	<u>Total</u>
2 Years	\$ 7,200	\$ 8,800	\$16,600
3 Years	10,800	9,200	20,000
4 Years	14,400	10,600	25,000

For the Army Reserve, high school graduates with AFQT scores of 50 or greater who agree to a 6-year term would receive the same benefits as provided in the current GI Bill (\$5,040). No contribution would be required for Reserve soldiers. The method of payout would be the same as the present system--through the Veteran's Administration.

The key assumption in the proposed program is that the soldier contributions would be invested by the Army in an interest-bearing account. For cost estimation, annual interest rates are assumed to be 8.5 percent from FY 1987 through FY 1989, and 4.5 percent from FY 1990 on (based upon OMB-directed assumptions

for government calculations). For cost comparison, the same participation rates and usage rates are used for the present and proposed programs. (NOTE: All participation and usage rates are based upon historical VEAP data, but have been weighted by AFQT score category since higher scoring soldiers participate more and use more of their benefit. Average rates were: percent signing up = 49; percent using benefit = 61; percent of benefit used = 70.)

Based on the participation and payout factors described above, under a cash accounting system, the steady-state cost (Active and Reserve) of the basic program in FY 1986 dollars would be approximately \$100 million per year. When the cost of the kickers is added to the basic cost, the total would be about \$200 million per year in FY 1986 dollars. However, due to program start-up contributions, without any payout requirements, along with accumulated interest, the fund would be expected to have a surplus for the first 5 to 8 years. On a steady-state basis, the Army-only program would save (in FY 1986 dollars) \$22 million per year in Army costs and \$136 million in total DoD GI Bill costs (Wegner, 1986 -- see Appendix B). It should be kept in mind that these savings assume an Army-only GI Bill with kickers valued at the rates in table 8. Table 9 presents a cost comparison.

The savings result from two important policy decisions. First, soldier contributions are placed in interest-bearing accounts. Second, soldier contributions are significantly greater than under the current GI Bill. The rationale for increased service member contributions is based upon the straightforward assumption that if a GI Bill is to survive, it must be less costly. Further, the budget dollars for the basic entitlement need to continue to be kept separate from the ACF (kicker) portion; the latter is more easily justified,

Table 9. Steady-state cost comparison of current and proposed educational incentives program (in current \$M)

<u>Army Comparison</u>	<u>Basic Program</u>	<u>ACF</u>	<u>Total</u>	<u>Difference</u>
Current Program	\$134.1	\$ 88.2	\$222.3	
Proposed Program	97.6	102.3	199.9	\$ 22.2
<u>DoD Comparison</u>				
Current Program	247.5	88.2	335.7	
Proposed Program	97.6	102.3	199.9	\$135.6

NOTE: Due to pay-in greater than obligations for first 5 to 8 years, budget would show surplus until FY 1992-1996.

based upon targeted incentive arguments. Basically, the current proposal provides the Army with the means to compete in the youth labor market and it also aligns the educational incentive with the dual market strategy described earlier--basic program for the work-oriented; ACF for the college-bound. Some of the work-oriented youth would not see any necessity for the program; however, many would recognize it as an opportunity to become readjusted to civilian life through civilian skill training. (The current Army sign-up rate for soldiers with an AFQT score of 50 and above is around 60 percent.)

Perhaps it is time to lay to rest the Gates Commission assumption that pay is more efficient than educational benefits for attracting quality recruits. A consensus is needed among policy makers that recognizes the potential of educational incentives to compensate for certain hardships of service; and also

recognizes that there are critical differences between services as well as between certain jobs within a given service. When geared to intra- and inter-service differences, a relatively inexpensive, basic educational program for all, along with a significant college incentive for bright high school graduates may, when compared to universal increases in pay and bonuses, be not only more effective but more efficient as well.

REFERENCES

- Amor, David J., Richard L. Fernandez, Kathy Bers, and Donna Schwarzback. Recruit Aptitudes and Army Job Performance. R-2874-MRAL. Santa Monica, CA: Rand Corporation, September 1982.
- Army Research Institute, "ARI Forecasting Model," Army Research Institute Information Paper, Alexandria, VA: March 1986.
- Blair, John D., and Robert L. Phillips. "Job Satisfaction Among Youth in Military and Civilian Work Settings." Armed Forces and Society, Volume 9, Number 4. Sage Publications, Summer 1983.
- Bray, Robert M., Mary Ellen McCalla, Frederick W. Immerman, L. Lynn Guess, and George H. Dunteman. Youth Attitude Tracking Study II: Wave 15 - Fall 1984. Research Triangle Institute 2927105-02FR. Arlington, VA: Defense Manpower Data Center, April 1985.
- Daula, Thomas V., and D. Alton Smith. "Estimating Enlistment Models for the US Army." Research in Labor Economics, Volume 7. Greenwich, CT: Jai Press, Inc., 1985.
- Depuy, William E. "Technology and Manpower: Army Perspective." In William Bowman, Roger Little, and G. Thomas Sicilia (eds). The All-Volunteer Force After a Decade: Retrospect and Prospect. Washington: Pergamon - Brassey's, 1986.
- Economic Research Laboratories. "Recruiting Market Assessment-Army," Reston, VA: Economic Research Laboratories, December 1985.
- Egbert, Robert L., et al. Fighter I: An Analysis of Combat Fighters and Non-Fighters. HUMPRO Technical Report 44. AD 158178. Presidio of Monterey, CA: US Army Leadership Human Research Unit, under the technical supervision of the George Washington University Human Resources Research Office, 1957.
- Fairchild, Charles K., et al. The Recruiting Resources Allocation System. Cambridge, MA: Abt Associates, Inc., 1984.
- Fechter, Allen. "Impact of Pay and Draft Policy on Army Enlistment Behavior." Studies Prepared for the President's Commission on an All Volunteer Armed Force. Washington: US Government Printing Office, 1970.
- Fernandez, Richard L. Enlistment Effects and Policy Implications of the Educational Assistance Test Program. R-2935-MRAL. Santa Monica, CA: The Rand Corporation, September 1982.

REFERENCES (CONTINUED)

- Fox, Wayne L., et al. Aptitude Level and Acquisition of Skills and Knowledges in a Variety of Military Training Tasks. Technical Report 69-6. Washington: George Washington University, Human Resources Research Office, May 1969.
- Gates, Thomas, et al. The Report of the President's Commission on all All Volunteer Armed Force. Washington: US government Printing Office, February 1970.
- Janowitz, Morris, and Charles Moskos. "Five Years of the All-Volunteer Force: 1973-1978." Armed Forces and Society, Volume 5, Number 2, Winter 1979.
- Kim, Choongsoo, et al. The All Volunteer Force: An Analysis of Youth Participation, Attrition, and Reenlistment. Columbus, OH: Center for Human Resource Research, Ohio State University, May 1980.
- Moskos, Charles C. Jr. "Citizen Soldier and an AVF GI Bill: Alternative to the Draft." Evanston, IL: Department of Sociology, Northwestern University, October 1982.
- Patchell, Donald G. "USAREC Enlistments Supply Model." US Army Recruiting Command, Fort Sheridan, IL, March 1986.
- Phillips, Robert L. "Quality of Employment and Job Satisfaction of Youth in the Armed Forces." Chapter 3, Kim et al. The All Volunteer Force: An Analysis of Youth Participation, Attrition, and Reenlistment. Columbus, OH: Center for Human Resource Research, Ohio State University, May 1980.
- Scribner, Barry, et al. "Are Smart Tankers Better Tankers: AFQT and Military Productivity." Armed Forces and Society, Volume 12, Number 2, Winter 1986.
- Schilders, Joyce L., and Frances C. Grafton. A Natural Experiment: Analysis of an Almost Unselected Army Population. Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences, August 1983.
- Stouffer, Samuel A., et al. "The American Soldier: Adjustment During Army Life." Volume I of Studies in Social Psychology in World War II, Osborn, Frederick, et al; eds. 4 vols. Princeton, NJ: Princeton University press, 1949.
- Toomepuu, Juri. Soldier Capability - Army Combat Effectiveness (SCACE), Volume I, Main Report. AD 302417. Fort Benjamin Harrison, IN: US Army Soldier Support Center, April 1981.
- Wegner, Robert. "Proposed Army GI Bill/ACF," information paper. Fort Sheridan, IL: US Army Recruiting Command, May 1986.

APPENDIX A

USARCPAE-RS

19 November 1985

CALCULATION OF NOMINAL VALUE AND PROJECTED COST OF FY 82 ACF FOR 4-YEAR ENLISTEES

The nominal value of ACF for FY 82 4-year enlistee cohort is defined as follows:

$$N = T \times V = 15,126 \times 20,100 = \$304M$$

Where N = the nominal value of ACF for the 4-year enlistee cohort.

T = the number of ACF takers enlisting for 4 years

(taker is an eligible enlisting for an ACF MOS) (= 15,126)

V = 4-year term ACF offer in FY 82 (= \$20,100)

The cost is estimated as follows:

$$C = P \times A \times PV \times U \times R = 9,095 \times 15,670 \times .665 \times .69 \times .45 \\ = \$29.4M$$

Where C = the estimated cost of ACF for FY 82 4-year enlistee cohort, in FY 82 dollars

P = number of 4-year enlistee ACF participants ($= \frac{9,095}{15,126} = 60.1\%$ of takers)

A = average amount of eligibility earned per participant (= \$15,670)

PV = present (FY 82) value of ACF dollars committed for future payment, based on 6.0 percent annual inflation rate and the simplifying assumption that 3 years after discharge is the mid-point for use $PV = 1/(1 + 6.0)^7 = .665$

U = percent of usage of A, based on VA study of old GI Bill usage by HSDG (= .69)

R = estimated user rate for 4-year enlistees (percent of participants using the benefits) (= .45)

The average amount of eligibility earned per participant, A, is estimated as follows:

$$A = \frac{M}{L} \times K = \frac{23.12}{27} \times 18,300 = \$15,670$$

Where M = estimated average months of contribution (= 23.12)

L = total months needed to get total kicker amount (= 27)

K = kicker amount for 4-year term (= \$18,300)

The 4-year term user rate is estimated as follows:

$$R = TR \times DP \times G \times S = .553 \times .856 \times .975 \times .977 = .451$$

Where TR = 2-year user rate (users as percent of participants) (= .553)

DP = Ratio of 4-year enlistee participation rate to 2-year enlistee participation rate (= .856)

G = age factor derived from 2-year enlistee user profile (= .975)

S = TSC factor derived from 2-year enlistee user profile (= .977)

CALCULATION OF NOMINAL VALUE AND PROJECTED COST OF FY 82 ACF
FOR 4-YEAR ENLISTEES (CONTINUED)

The age factor, G, is based on the assumption that age is related to the probability of entering a post-secondary school education program and empirical evidence of this from 2-year enlistee ACF user data. The age factor is calculated as follows:

$$G = 1 - (H \times D) = 1 - (.0109 \times 2.3) = .975$$

Where H = the average difference in 2-year user rate by age per year of age

D = Average age difference at end of term between 4- and 2-year enlistees

The TSC factor, S, is based on the assumption that TSC is related to the probability of entering a post-secondary school education program and empirical evidence from 2-year enlistee ACF user data. The TSC factor is calculated as follows:

$$S = \frac{RS}{TS} = \frac{.541}{.553} = .977$$

Where RS = the 4-year enlistee TSC-adjusted user rate (= .541)

TS = the 2-year enlistee user rate (= .553)

The TSC adjusted user rate is calculated as follows:

$$\frac{U_{2i} \times P_{4i}}{P}$$

Where U_{2i} = TSCi rate of two-year users, as percent of participants
(= .569, .545, .448)

P_{4i} = number of four-year participants in TSCi (= 5137, 3149, 809)

i = TSC 1, 2, 3A

BASED ON CURRENTLY AVAILABLE FY 82 2-YEAR ENLISTEE USER RATE THE ESTIMATED

COST OF THE FY 82 4-YEAR ENLISTEE ACF IS $\frac{29.4}{304} = 9.67\%$ OF THE NOMINAL VALUE

CALCULATION OF NOMINAL VALUE AND PROJECTED COST OF FY 82 ACF FOR 3-YEAR ENLISTEES

The nominal value of ACF for FY 82 3-year enlistee cohort is defined as follows:

$$N = T \times V = 10,211 \times 17,400 = \$177.7M$$

Where N = the nominal value of ACF for the 3-year enlistee cohort.
T = the number of ACF takers enlisting for 3 years
(taker is an eligible enlisting for an ACF MOS) (= 10,211)
V = 3-year term ACF offer in FY 82 (= \$17,400)

The cost is estimated as follows:

$$C = P \times A \times PV \times U \times R = 7,933 \times 11,106 \times .70 \times .69 \times .477 \\ = \$20.3M$$

Where C = the estimated cost of ACF for FY 82 3-year enlistee cohort, in FY 82 dollars
P = number of 3-year enlistee ACF participants (= 7,933)
A = average amount of eligibility earned per participant (= \$11,606)
PV = present (FY 82) value of ACF dollars committed for future payment, based on 6.0 percent annual inflation rate and the simplifying assumption that 2 years after discharge is the mid-point for use $PV = 1/(1 + .06)^6 = .70$
U = percent of usage of A, based on VA study of old GI Bill usage by HSDG (= .69)
R = estimated user rate for 3-year enlistees (percent of participants using the benefits) (= .477)

The average amount of eligibility earned per participant, A, is estimated as follows:

$$A = \frac{M}{L} \times K = \frac{26.1}{27} \times 12,000 = \$11,606$$

Where M = estimated average months of contribution (= 26.1)
L = total months needed to get total kicker amount (= 27)
K = kicker amount for 4-year term (= \$12,000)

The 4-year term user rate is estimated as follows:

$$R = TR \times DP \times G \times S = .553 \times .929 \times .999 \times .942 = .477$$

Where TR = FY 82 2-year user rate (users as percent of participants) (= .553)
DP = Ratio of 3-year enlistee participation rate to 2-year enlistee participation rate (= .929)
G = age factor derived from 2-year enlistee user profile (= .985)
S = TSC factor derived from 2-year enlistee user profile (= .942)

CALCULATION OF NOMINAL VALUE AND PROJECTED COST OF FY 82 ACF
FOR 3-YEAR ENLISTEES (CONTINUED)

The age factor, G, is based on the assumption that age is related to the probability of entering a post-secondary school education program and empirical evidence of this from 3-year enlistee ACF user data. The age factor is calculated as follows:

$$G = 1 - (H \times D) = 1 - (.014 \times 1.3) = .985$$

Where H = the average difference in 3-year user rate by age per year of age

D = Average age difference at end of term between 3- and 2-year enlistees

The TSC factor, S, is based on the assumption that TSC is related to the probability of entering a post-secondary school education program and empirical evidence from 3-year enlistee ACF user data. The TSC factor is calculated as follows:

$$S = \frac{RS}{TS} = \frac{.521}{.553} = .942$$

Where RS = the 3-year enlistee TSC-adjusted user rate (= .521)

TS = the 2-year enlistee user rate (= .553)

The TSC adjusted user rate is calculated as follows:

$$\frac{U_{2i} \times P_{4i}}{P}$$

Where U_{2i} = TSCi rate of two-year users, as percent of participants
(= .569, .545, .448)

P_{3i} = number of four-year participants in TSCi (= 391, 3895, 3542)

i = TSC 1, 2, 3A

BASED ON CURRENTLY AVAILABLE FY 82 2-YEAR ENLISTEE USER RATE THE ESTIMATED

COST OF THE FY 82 3-YEAR ENLISTEE ACF IS $\frac{20.3}{177.7} = 11.4\%$ OF THE NOMINAL VALUE

CALCULATION OF NOMINAL VALUE AND PROJECTED COST OF FY 82 ACF
FOR 2-YEAR ENLISTEES

The nominal value of ACF for FY 82 2-year enlistee cohort is defined as follows:

$$N = T \times V = 12,800 \times 6,374 = \$81.6M$$

Where N = the nominal value of ACF for the 2-year enlistee cohort.

T = the number of ACF takers enlisting for 2 years

(taker is an eligible enlisting for an ACF MOS) (= 6,374)

V = 2-year term ACF offer in FY 82 (= \$12,800)

The cost is estimated as follows:

$$C = P \times A \times PV \times U \times R = 4,482 \times 6,208 \times .747 \times .69 \times .553 \\ = \$7.93M$$

Where C = the estimated cost of ACF for FY 82 2-year enlistee cohort, in FY 82 dollars

P = number of 2-year enlistee ACF participants (= 4,482)

A = average amount of eligibility earned per participant (= \$6,208)

PV = present (FY 82) value of ACF dollars committed for future payment, based on 6.0 percent annual inflation rate and the simplifying assumption that 3 years after discharge is the mid-point for use $PV = 1/(1 + .06)^5 = .747$

U = percent of usage of A, based on VA study of old GI Bill usage by HSDG (= .69)

R = estimated user rate for 2-year enlistees (percent of participants using the benefits) (= .553)

The average amount of eligibility earned per participant, A, is estimated as follows:

$$A = \frac{M}{L} \times K = \frac{18.6}{24} \times 8,000 = \$6,208$$

Where M = estimated average months of contribution (= 18.6)

L = total months needed to get total kicker amount (= 24)

K = kicker amount for 2-year term (= \$8,000)

BASED ON CURRENTLY AVAILABLE FY 82 2-YEAR ENLISTEE USER RATE THE ESTIMATED

COST OF THE FY 82 2-YEAR ENLISTEE ACF IS $\frac{7.93}{81.6} = 9.7\%$ OF THE NOMINAL VALUE

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APPENDIX B

USARCPAE-RS
21 May 1986

INFORMATION PAPER

SUBJECT: Calculations in Support of an Army GI Bill

ISSUE: To provide information on time value of money and cash flow calculations for the proposed Army GI Bill/ACF

FACTS: The proposed contingency plan for Army GI Bill/ACF is described on the briefing chart at Enclosure 1. Calculations of the budget requirements, their present value, and steady state costs are shown below:

1. To calculate the budget requirement in fiscal year 2000 (F_{00}), the fund surplus or budget requirement in each fiscal year is calculated.

Let F_t = Fund in year t
 NC_t = Net contributions in year t
 B_t = Benefits paid in year t
 C_t = Contributions in year t
 R_t = Refunds in year t
 i_t = Interest in year t
 f_t = Uniform-series compound-amount factor

Net contributions are defined as:

$$NC_t = C_t - B_t - R_t$$

when $NC_t \geq 0$ there is a fund surplus
 $NC_t < 0$ there is a budget requirement

When there is a fund surplus, the surplus earns interest over the entire year. Net contributions earn interest as they are received. The interest for both the fund and the contributions are compounded monthly.

a. For years with a positive balance in the fund:

$$F_t = \left(1 + \frac{i_t}{12}\right)^{12} F_{t-1} + (f_t NC_t)$$

$$\text{where } f_t = \frac{\left(1 + \frac{i_t}{12}\right)^{12} - 1}{i}$$

USARCPAE-RS

SUBJECT: Calculations in Support of an Army GI Bill

b. f_t is derived as follows:

$$\begin{aligned}
 s &= \left(\frac{NC_t}{12}\right) \left(1 + \frac{i}{12}\right)^{12-1} + \left(\frac{NC_t}{12}\right) \left(1 + \frac{i}{12}\right)^{12-2} + \dots \quad (1) \\
 &\quad \left(\frac{NC_t}{12}\right) \left(1 + \frac{i}{12}\right)^{12-10} + \left(\frac{NC_t}{12}\right) \left(1 + \frac{i}{12}\right)^{12-11} + \left(\frac{NC_t}{12}\right) = \\
 &= \left(\frac{NC_t}{12}\right) \left[\left(1 + \frac{i}{12}\right)^{12-1} + \left(1 + \frac{i}{12}\right)^{12-2} + \dots + \right. \\
 &\quad \left. \left(1 + \frac{i}{12}\right)^{12-10} + \left(1 + \frac{i}{12}\right)^{12-11} + 1 \right]
 \end{aligned}$$

c. S is the future value we want to find. To simplify the formula, both sides of equation 1 are multiplied by $1 + \frac{i}{12}$ which increases the value of exponents by 1.

$$\begin{aligned}
 s \left(1 + \frac{i}{12}\right) &= \left[\left(\frac{NC_t}{12}\right) \left(1 + \frac{i}{12}\right)^{12} + \left(1 + \frac{i}{12}\right)^{12-1} + \dots + \right. \quad (2) \\
 &\quad \left. \left(1 + \frac{i}{12}\right)^{12-10} + \left(1 + \frac{i}{12}\right)^{12-11} \right]
 \end{aligned}$$

To solve for S , subtract (1) from (2):

$$\begin{aligned}
 s \left(1 + \frac{i}{12}\right) - s &= \left(\frac{NC_t}{12}\right) \left[\left(1 + \frac{i}{12}\right)^{12} - 1 \right] \quad (3) \\
 s \left[1 + \frac{i}{12} - 1 \right] &= \left(\frac{NC_t}{12}\right) \left[\left(1 + \frac{i}{12}\right)^{12} - 1 \right]
 \end{aligned}$$

$$S = \left(\frac{NC_t}{12} \right) \left[\frac{\left(1 + \frac{i}{12} \right)^{12} - 1}{\frac{i}{12}} \right]$$

$$S = NC_t \left[\frac{\left(1 + \frac{i}{12} \right)^{12} - 1}{i} \right]$$

d. For years when there is a budget requirement the fund is:

$$F_t = C_t - R_t - B_t + F_{t-1} = NC_t + F_{t-1}$$

when $F_{t-1} > 0$

and $F_t = C_t - R_t - B_t = NC_t$

when $F_{t-1} < 0$

These calculations are found in table C at Enclosure 2.

2. Calculating the present value of the budget requirement in FY 2000.

a. The cost of the program in the year 2000 is estimated to be \$222.8M. The present value of this sum is calculated as follows:

$$PV_{87} = D_{87} D_{88} D_{89} \dots D_{98} D_{99} D_{00} \times F_{00}$$

where PV_{87} is present value of F_{00} in 1987 dollars

F_{00} is budget requirement in year 2000

D_{xx} is discount factor in fiscal year xx

$$F_{00} = \$222.8M$$

b. In FY 00 the benefits are assumed paid out uniformly during the year so D_{00} is found as follows:

$$D_{00} = \frac{\left(1 + \frac{i_{00}}{12} \right)^{12} - 1}{\left(i_{00} \right) \left(1 + \frac{i_{00}}{12} \right)^{12}}$$

where i_{00} is the interest rate for FY 00

$$i_{00} = 4.5 \text{ percent}$$

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c. The other discount factors are computed on the basis of monthly discounting:

$$D_{xx} = \left(\frac{1}{1 + \frac{i_{xx}}{12}} \right)^{12}$$

for $xx = 87, 88, 89, \dots, 98, 99$

d. A list of interest rates used is found in table A and the present value calculations in table B at Enclosure 2. The present value of \$222.8M in FY 87 (PV₈₇) is \$110M.

3. All contributions not used are assumed refunded in the year after service. Benefits used and soldier contributions are calculated in a similar manner. To calculate payment of benefits, it is determined how many dollars of benefits will be used over entire 10 year period after service by enlistees for different terms of service. Payments are allocated to each year after service. Let $B_{k,j}$ be benefits used by enlistees for k TOS (2-, 3-, or 4-year) in year $j(1,2,\dots,10)$ after service.

B_t = Benefits paid in fiscal year t

then $B_{87} = 0$

$B_{88} = 0$

$B_{89} = B_{2,1}$

$B_{90} = B_{2,1} + B_{2,2} + B_{3,1}$

$B_{91} = B_{2,1} + B_{2,2} + B_{2,3} + B_{3,1} + B_{3,2} + B_{4,1}$

$B_{92} = B_{2,1} + B_{2,2} + B_{2,3} + B_{2,4} + B_{3,1} + B_{3,2} + B_{3,3} + B_{4,1} + B_{4,2}$

\vdots

$$B_{00} = \sum_{j=1}^{10} \sum_{k=2}^4 B_{k,j}$$

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4. The value of benefits paid in year j after service by term of service k ($B_{k,j}$) was calculated as:

$$B_{k,j} = B_k \times P_j$$

where B_k is the total dollars of benefits used by TOS k and P_j is the proportion of benefits used in year j after service.

5. B_k is calculated as follows:

$$B_k = E_k \times b_k \times t_k \times u_k \times r_k$$

where E_k is number of average enlistees in TOS k (= 10,710, 66,640, and 42,840 for 2-, 3-, and 4-year, respectively)

b_k is benefits average offered TOS k (= 10,133, 13,867, and 16,267 for 2-, 3-, and 4-year, respectively)

t_k is average taker rate TOS k (= .494 for each term of service)

u_k is average user rate TOS k (= .61 for each term of service)

and r_k is average percent of benefits actually used (= .7 for each term of service)

For further reading, Managerial and Engineering Economy, by George A. Taylor, is recommended.

6. Simplified calculations of the cost of the program can be made. In the proposed program:

a. Soldier contributes \$1,200.

b. Two-thirds of enlistees entitled to benefit of \$8,100 (\$1,200 + \$6,900).

c. One-third of enlistees are in critical MOS, entitled to benefit of \$10,800 (\$1,200 + \$9,600).

d. Average benefit per enlistee is \$9,000.

7. The cost of the proposed program is estimated as follows:

$$C = B - S$$

where, C = Present value (PV) cost of proposed program

B = Present value of total drawn by beneficiaries

S = Present value of soldier contribution

B = [Average benefit (\$9,000) x number enlisting (301,000) x percentage signing up (.494) x percentage actual users (.61) x average percentage benefit used (.70) x present value of benefits (.555)] = \$317.2M.

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$S = [\text{Soldier contribution } (\$1,200) \times \text{number enlisting } (301,000) \times \text{percentage signing up } (.494) \times \text{present value } (.952)] = \$169.9\text{M}.$

$C = [\$317.2\text{M} - \$169.9\text{M} = \$147.3\text{M}].$

8. The present value calculation of Government contribution is based on a 9.5 percent discount rate, and the usage schedule of the old GI Bill, shown in the following table:

<u>Year After Discharge</u>	<u>PV of \$1 at Enlistment</u>	<u>% of Benefits Used</u>	<u>PV of % of Benefits Used</u>
1	\$0.64	\$46.5%	\$0.295
2	\$0.58	16.5%	\$0.096
3	\$0.53	11.3%	\$0.060
4	\$0.48	6.1%	\$0.030
5	\$0.44	6.1%	\$0.027
6	\$0.40	3.8%	\$0.015
7	\$0.37	3.8%	\$0.014
8	\$0.34	2.5%	\$0.008
9	\$0.31	1.4%	\$0.004
10	\$0.28	2.0%	\$0.006
		100.0%	\$0.555

9. The present value of the \$1,200 soldier contribution is calculated as follows:

$$\left\{ \frac{1 - [(1.095)^{1/12}]^{-12}}{(1.095)^{1/12} - 1} \right\} \times 100 = \$1,142.82$$

10. Based on similar methodology, the present value cost of the current GI Bill is \$210.8M. Savings resulting from implementation of proposed program = \$210.8M - \$147.3M = \$63.5M.

Dr. Wegner/2741

CONTINGENCY PLAN FOR ARMY GI BILL AND COLLEGE FUND

A. BASIC FEATURES

- 0 PROPOSED FOR INCORPORATION INTO LEGISLATION ENDING CURRENT GI BILL AND KICKER PROGRAM
- 0 STARTING UPON EXPIRATION OF CURRENT PROGRAM
- 0 FUNDED BY THE ARMY, PAYMENTS ADMINISTERED BY VA
- 0 BUDGETED ON AN ACTUAL COST BASIS USING HISTORICAL USAGE FACTORS

B. REGULAR ARMY PROGRAM

1. ELIGIBILITY CRITERIA FOR:

- 0 BASIC BENEFITS
 - 00 MONTHLY SERVICE
 - 00 MUST RECEIVE HIGH SCHOOL DIPLOMA OR EQUIVALENT CERTIFICATE PRIOR TO ETS OF INITIAL ENLISTMENT
 - 00 SIGN UP FOR REFUNDABLE DEDUCTION OF \$100 FOR EACH MONTH OF SERVICE
- 0 ACF BENEFITS
 - 00 MFS
 - 00 HIGH SCHOOL DIPLOMA
 - 00 AFOT SCORE OF 50 OR ABOVE
 - 00 ENLIST IN SPECIFIC CRITICAL MFS

2. CONTRIBUTION AND BENEFITS BY TERM OF SERVICE

TERM OF SERVICE	SOLDIER'S CONTRIBUTION	ARMY CONTRIBUTION	TOTAL BASIC PROGRAM	ARMY COLLEGE FUND	TOTAL WITH ACF
2	\$2,400	\$4,800	\$ 7,200	\$ 8,800	\$16,000
3	\$3,600	\$7,200	\$10,800	\$ 9,200	\$20,000
4	\$4,800	\$9,600	\$14,400	\$10,600	\$25,000

- 0 SOLDIERS CONTRIBUTE \$100 PER MONTH IN EACH MONTH OF SERVICE. MUST PUT IN THE ENTIRE AMOUNT TO BECOME ELIGIBLE, BUT MAY WITHDRAW ANYTIME.
- 0 SOLDIER CONTRIBUTIONS INVESTED IN AN INTEREST BEARING FUND. ASSETS ARE NON-MARKETABLE, SPECIAL ISSUE TREASURY SECURITIES WITH AN ESTIMATED YIELD RANGING FROM 0.5 PERCENT PER YEAR IN FY 87 TO 4.5 PERCENT IN FY 90

3. BUDGET REQUIREMENTS AND COST

- 0 NO BUDGETING IS NEEDED UNTIL FY 95

SURPLUS IN THE FUND (\$ MILLIONS)										BUDGET REQUIREMENTS (STEADY STATE)									
FY 87	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06
77	234	430	552	508	415	282	122	61	196	207	214	220	223	223					
67	188	339	394	346	269	175	73	34	107	108	106	105	101	97					

C. USAR PROGRAM

1. ELIGIBILITY CRITERIA AND BENEFITS

- 0 SAME AS CURRENT GI BILL; \$5,040 BENEFIT, SAME PAYOUT

2. BUDGET REQUIREMENTS AND COST

- 0 ASSUMPTIONS:
 - 00 BENEFITS WILL BE USED WITHIN THE FIRST 6 YEARS
 - 00 NUMBER OF USERS REMAINS CONSTANT
 - 00 LITTLE USAGE DURING THE 1ST YEAR, MAXIMUM USE IN 2ND, AND GRADUAL DECLINE UNTIL THE 6TH YEAR:

1ST YEAR	2ND YEAR	3RD YEAR	4TH YEAR	5TH YEAR	6TH YEAR
.15	.30	.20	.20	.10	.05

0 BUDGET REQUIREMENT

FY 87	FY 88	FY 89	FY 90	FY 91	(STEADY STATE)	FY 92	FY 93
4.9M	15.6M	19.6M	25.6M	28.6M	30.1M	30.1M	30.1M

0 COST IN FY 86 DOLLARS

3.9M	11.1M	14.9M	18.5M	19.7M	19.8M	19.0M	
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D. HQDA ACTIONS REQUIRED FOR QUICK IMPLEMENTATION

1. PREPARE DETAILED PROGRAM DOCUMENTATION
2. COORDINATE AND OBTAIN APPROVAL WITHIN DEPARTMENT OF THE ARMY
3. OBTAIN DOD APPROVAL AND COORDINATE WITH VA
4. PREPARE LEGISLATIVE PROPOSAL
5. COORDINATE WITH APPROPRIATE CONGRESSIONAL STAFFS
6. SUBMIT PROPOSAL FOR LEGISLATIVE ACTION

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Table A. Interest Rates Used

YEAR	INTEREST RATE
1967	8.43%
1968	7.48%
1969	5.97%
1970	4.97%
1971	4.98%
1972	4.98%
1973	4.98%
1974	4.98%
1975	4.98%
1976	4.98%
1977	4.98%
1978	4.98%
1979	4.98%
1980	4.98%
1981	4.98%
1982	4.98%
1983	4.98%
1984	4.98%

Table C. Calculation of Fund Surplus or Budget Requirement

YEAR	BENEFIT USAGE	SOLDIER CONTRIBUTION	REFUNDS	NET CONTRIBUTION	INTEREST CONTRIBUTION	CUMULATIVE FUND
1967	0	171,249,431	0	171,249,431	15,424,415	174,873,847
1968	0	142,497,244	0	142,497,244	15,498,288	133,042,399
1969	110,445,046	120,357,260	10,953,131	119,404,124	15,498,288	113,906,136
1970	108,641,332	122,721,240	11,171,037	111,549,293	15,498,288	98,411,310
1971	108,143,132	122,721,240	0	122,721,240	15,498,288	82,913,022
1972	123,546,042	122,721,240	0	122,721,240	15,498,288	67,414,734
1973	123,546,042	122,721,240	0	122,721,240	15,498,288	51,916,446
1974	123,546,042	122,721,240	0	122,721,240	15,498,288	36,418,158
1975	123,546,042	122,721,240	0	122,721,240	15,498,288	20,919,870
1976	123,546,042	122,721,240	0	122,721,240	15,498,288	5,421,582
1977	123,546,042	122,721,240	0	122,721,240	15,498,288	(10,076,706)
1978	123,546,042	122,721,240	0	122,721,240	15,498,288	(25,574,994)
1979	123,546,042	122,721,240	0	122,721,240	15,498,288	(41,073,282)
1980	123,546,042	122,721,240	0	122,721,240	15,498,288	(56,571,570)
1981	123,546,042	122,721,240	0	122,721,240	15,498,288	(72,069,858)
1982	123,546,042	122,721,240	0	122,721,240	15,498,288	(87,568,146)
1983	123,546,042	122,721,240	0	122,721,240	15,498,288	(103,066,434)
1984	123,546,042	122,721,240	0	122,721,240	15,498,288	(118,564,722)

Table B. The Present Value of Unfunded Benefits

YEAR	84	85	86	87	88	89	90	91	92	93	94
1967	647,844,201	523,488,831	423,488,831	323,488,831	223,488,831	123,488,831	23,488,831	0	0	0	0
1968	518,146,703	418,146,703	318,146,703	218,146,703	118,146,703	18,146,703	0	0	0	0	0
1969	338,915,437	238,915,437	138,915,437	38,915,437	0	0	0	0	0	0	0
1970	158,682,570	58,682,570	0	0	0	0	0	0	0	0	0
1971	135,808,570	35,808,570	0	0	0	0	0	0	0	0	0
1972	115,424,944	15,424,944	0	0	0	0	0	0	0	0	0
1973	95,041,411	0	0	0	0	0	0	0	0	0	0
1974	74,657,878	0	0	0	0	0	0	0	0	0	0
1975	54,274,345	0	0	0	0	0	0	0	0	0	0
1976	33,890,812	0	0	0	0	0	0	0	0	0	0
1977	13,507,279	0	0	0	0	0	0	0	0	0	0
1978	3,123,746	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Recognizing the unique nature of military service, the differences among the various services constituting the Armed Forces, the wide variances in jobs within a specific service, the need for quality accessions for the Army, and at least a two-segment youth market (work-oriented versus college-bound), a dual approach to the construction of enlistment incentives was adopted. It was suggested that college-bound youth would respond best to a shorter enlistment		

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commitment with high, post-service educational benefits. On the other hand, work-oriented youth would respond best to pay, bonuses, skill training, and job security.

The GI Bill or a similar type of incentive is essential for the execution of a dual market strategy. However, since cost has been the reason for most opposition to past and present GI Bills, a reduced cost, Army-only GI Bill was proposed, that would be targeted to skill demands and applicant human capital. The Army-only nature of the proposed bill stems from the contention, ranging as far back as the Gates Commission, that the Army has the most difficult recruiting mission. Further, such an incentive is not only key to the Army's dual market strategy, but also is designed to lessen interservice competition by opening a new market segment (college-bound) -- youth who would not otherwise consider any military service.

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